

Arcaro, K.F., Vakharia, D.D., Yang, Y., Gierthy, J.F. (1998) Lack of synergy by mixtures of weakly estrogenic hydroxylated polychlorinated biphenyls and pesticides. Environ Health Perspect 106(Suppl 4):1041-1046.

Arcaro, K.F., Yi, L., Seegal, R.F., Vakharia, D.D., Yang, Y., Spink, D.C., Brosch, K., Gierthy, J.F. (1999a) 2,2',6,6'-Tetrachlorobiphenyl is estrogenic *in vitro* and *in vivo*. J Cell Biochem 72:94-102.

Arcaro, K.F., O'Keefe, P.W., Yang, Y., Clayton, W., Gierthy, J.F. (1999b) Antiestrogenicity of environmental polycyclic aromatic hydrocarbons in human breast cancer cells. Toxicology 133:115-127.

Arnold, S.F., Robinson, M.K., Notides, A.C., Louis, J., Guillette, J., McLachlan, J.A. (1996) A yeast estrogen screen for examining the relative exposure of cells to natural and xenoestrogens. Environ Health Perspect 104:544-548.

Balaguer, P., Joyeux, A., Denison, M., Vincent, R., Gillesby, B., Zacharewski, T. (1996) Assessing the estrogenic and dioxin-like activities of chemicals and complex mixtures using *in vitro* recombinant receptor-reporter gene assays. Can J Physiol Pharmacol 74:216-222.

Beresford, N., Routledge, E.J., Harris, C.A., Sumpter, J.P. (2000) Issues arising when interpreting results from an *in vitro* assay for estrogenic activity. Toxicol Appl Pharmacol 162:22-33.

Bonefeld-Jørgensen, E.C., Andersen, H.R., Rasmussen, T.H., Vinggaard, A.M. (2001) Effect of highly bioaccumulated polychlorinated biphenyl congeners on estrogen and androgen receptor activity. Toxicology 158:141-153.

Charles, G.D., Bartels, M.J., Gennings, C., Zacharewski, T.R., Freshour, N.L., Gollapudi, B.B., Carney, E.W. (2000a) Incorporation of S-9 activation into an ER- transactivation assay. Reprod Toxicol 14: 207-216.

Charles, G.D., Bartels, M.J., Zacharewski, T.R., Gollapudi, B.B., Freshour, N.L., Carney, E.W. (2000b) Activity of benzo[a]pyrene and its hydroxylated metabolites in an estrogen receptor-reporter gene assay. Toxicol Sci 55:320-326.

Chen, C.W., Hurd, C., Vorobjekina, D.P., Arnold, S.F., Notides, A.C. (1997) Transcriptional activation of the human estrogen receptor by DDT isomers and metabolites in yeast and MCF-7 cells. Biochem Pharmacol 53:1161-1172.

Clemons, J.H., Allan, L.M., Marvin, C.H., Wu, Z., McCarry, B.E., Bryant, D.W., Zacharewski, T.R. (1998) Evidence of estrogen- and TCDD-like activities in crude and fractionated extracts of PM<sub>10</sub> air particulate material using *in vitro* gene expression assays. Environ Sci Technol 32:1853-1860.

Coldham, N.G., Dave, M., Sivapathasundaram, S., McDonnell, D.P., Connor, C., Sauer, M.J. (1997) Evaluation of a recombinant yeast cell estrogen screening assay. Environ Health Perspect 105:734-742.

Collins-Burow, B.M., Burow, M.E., Duong, B.N., McLachlan, J.A. (2000) Estrogenic and antiestrogenic activities of flavonoid phytochemicals through estrogen receptor binding-dependent and -independent mechanisms. Nutrition and Cancer 38:229-244.

Connor, K., Howell, J., Chen, I., Liu, H., Berhane, K., Sciarretta, C., Safe, S., Zacharewski, T. (1996) Failure of chloro-s-triazine-derived compounds to induce estrogen receptor-mediated responses *in vivo* and *in vitro*. Fundam Appl Toxicol 30:93-101.

Connor, K., Ramamoorthy, K., Moore, M., Mustain, M., Chen, I., Safe, S., Zacharewski, T., Gillesby, B., Joyeux, A., Balaguer, P. (1997) Hydroxylated polychlorinated biphenyls (PCBs) as estrogens and antiestrogens: Structure-activity relationships. Toxicol Appl Pharmacol 145:111-123.

De Boever, P., Demaré, W., Vanderperren, E., Cooreman, K., Bossier, P., Verstraete, W. (2001) Optimization of a yeast estrogen screen and its applicability to study the release of estrogenic isoflavones from a soygerm powder. Environ Health Perspect 109:691-697.

Dodge, J.A., Glasebrook, A.L., Magee, D.E., Phillips, D.L., Sato, M., Short, L.L., Bryant, H.U. (1996) Environmental estrogens: Effects on cholesterol lowering and bone in the ovariectomized rat. J Steroid Biochem Mol Biol 59:155-161.

Elsby, R., Maggs, J.L., Ashby, J., Paton, D., Sumpter, J.P., Park, B.K. (2001) Assessment of the effects of metabolism on the estrogenic activity of xenoestrogens: A two-stage approach coupling human liver microsomes and a yeast estrogenicity assay. J Pharmacol Exp Ther 296:329-337.

Fertuck, K.C., Kumar, S., Sikka, H.C., Matthews, J.B., Zacharewski, T.R. (2001b) Interaction of PAH-related compounds with the  $\alpha$  and  $\beta$  isoforms of the estrogen receptor. Toxicol Lett 121:167-177.

Fertuck, K.C., Matthews, J.B., Zacharewski, T.R. (2001a) Hydroxylated benzo[a]pyrene metabolites are responsible for *in vitro* estrogen receptor-mediated gene expression induced by benzo[a]pyrene, but do not elicit uterotrophic effects *in vivo*. Toxicol Sci 59:231-240.

Fielden, M.R., Chen, I., Chittim, B., Safe, S.H., Zacharewski, T.R. (1997) Examination of the estrogenicity of 2,4,6,2',6'-pentachlorobiphenyl (PCB 104), its hydroxylated metabolite 2,4,6,2',6'-pentachloro-4-biphenyol (HO-PCB 104), and a further chlorinated derivative, 2,4,6,2',4',6'-hexachlorobiphenyl (PCB 155). Environ Health Perspect 105:1238-1248.

Gaido, K.W., Leonard, L.S., Lovell, S., Gould, J.C., Babai, D., Portier, C.J., McDonnell, D.P. (1997) Evaluation of chemicals with endocrine modulating activity in a yeast-based steroid hormone receptor gene transcription assay. Toxicol Appl Pharmacol 143:205-212.

Gaido, K.W., Leonard, L.S., Maness, S.C., Hall, J.M., McDonnell, D.P., Saville, B., Safe, S.H. (1999) Differential interaction of the methoxychlor metabolite 2,2-Bis-(*p*-Hydroxyphenyl)-1,1,1-Trichloroethane with estrogen receptors  $\alpha$  and  $\beta$ . *Endocrinology* 140:5746-5753.

Gaido, K.W., Maness, S.C., McDonnell, D.P., Dehal, S.S., Kupfer, D., Safe, S. (2000) Interaction of methoxychlor and related compounds with estrogen receptor  $\alpha$  and  $\beta$ , and androgen receptor: Structure-activity studies. *Mol Pharmacol* 58:852-858.

Garner, C.E., Jefferson, W.N., Burka, L.T., Matthews, H.B., Newbold, R.R. (1999) *In vitro* estrogenicity of the catechol metabolites of selected polychlorinated biphenyls. *Toxicol Appl Pharmacol* 154:188-197.

Gierthy, J.F., Arcaro, K.F., Floyd, M. (1997) Assessment of PCB estrogenicity in a human breast cancer cell line. *Chemosphere* 34,Nos.5-7:1495-1505.

Go, V., Garey, J., Wolff, M.S., Pogo, B.G.T. (1999) Estrogenic potential of certain pyrethroid compounds in the MCF-7 human breast carcinoma cell line. *Environ Health Perspect* 107:173-177.

Gould, J.C., Leonard, L.S., Maness, S.C., Wagner, B.L., Conner, K., Zacharewski, T., Safe, S., McDonnell, D.P., Gaido, K.W. (1998) Bisphenol A Interacts with the estrogen receptor  $\alpha$  in a distinct manner from estradiol. *Molecular and Cellular Endocrinology* 142:203-214.

Graumann, K., Breithofer, A., Jungbauer, A. (1999) Monitoring of estrogen mimics by a recombinant yeast assay: synergy between natural and synthetic compounds? *Sci Total Environ* 225:69-79.

Harris, C.A., Henttu, P., Parker, M.G., Sumpter, J.P. The estrogenic activity of phthalate esters *in vitro*. *Environ Health Perspect* 105:802-811(1997).

Hodges, L.C., Bergerson, J.S., Hunter, D.S., Walker, C.L. (2000) Estrogenic effects of organochlorine pesticides on uterine leiomyoma cells *in vitro*. *Toxicol Sci* 54:355-364.

Hoogenboom, L.A.P., DeHaan, L., Hooijerink, D., Bor, G., Murk, A.J., Brouwer, A. (2001) Estrogenic activity of estradiol and its metabolites in the ER-CALUX assay with human T47D breast cells. *APMIS* 109:101-107.

Ichikawa, K., Kitaoka, M., Taki, M., Takaishi, S., Iijima, Y., Boriboon, M., Akiyama, T. (1997) Retrodihydrochalcones and homoisoflavones isolated from Thai medicinal plant *Dracaena loureiri* and their estrogen agonist activity. *Planta Med* 63:540-543.

Jobling, S., Reynolds, T., White, R., Parker, M.G., Sumpter, J.P. (1995) A variety of environmentally persistent chemicals, including some phthalate plasticizers, are weakly estrogenic. *Environ Health Perspect* 103:582-587.

Jones, P.A., Baker, V.A., Irwin, A.J.E., Earl, L.K. (1998) Interpretation of the *in vitro* proliferation response of MCF-7 cells to potential oestrogens and non-oestrogenic substances. *Toxicol In Vitro* 12:373-382.

Klotz, D.M., Beckman, B.S., Hill, S.M., McLachlan, J.A., Walters, M.R., Arnold, S.F. (1996) Identification of environmental chemicals with estrogenic activity using a combination of *in vitro* assays. *Environ Health Perspect* 104:1084-1089.

Klotz, D.M., Arnold, S.F., McLachlan, J.A. (1997) Inhibition of 17 beta-estradiol and progesterone activity in human breast and endometrial cancer cells by carbamate insecticides. *Life Sci* 60:1467-1475.

Korner, W., Hanf, V., Schuller, W., Bartsch, H., Zwirner, M., Hagenmaier, H. (1998) Validation and application of a rapid *in vitro* assay for assessing the estrogenic potency of halogenated phenolic chemicals. *Chemosphere* 37:2395-2407.

Kraichely, D.M., Katzenellenbogen, J.A., Katzenellenbogen, B.S. (2000) Conformational changes and coactivator recruitment by novel ligands for estrogen receptor-alpha and estrogen receptor-beta: Correlation with biological character and distinct differences among SRC coactivator family members. *Endocrinology* 141:3534-3545.

Kramer, V.J., Helferich, W.G., Bergman, A., Klasson-Wehler, E., Giesy, J.P. (1997) Hydroxylated polychlorinated biphenyl metabolites are anti-estrogenic in a stably transfected human breast adenocarcinoma (MCF7) cell line. *Toxicol Appl Pharmacol* 144:363-376.

Kuiper, G.G.J.M., Lemmen, J.G., Carlsson, B., Corton, J.C., Safe, S.H., Saag, P.Tvd., Burg Bvd., Gustafsson, J.-A. (1998) Interaction of estrogenic chemicals and phytoestrogens with estrogen receptor  $\beta$ . *Endocrinology* 139:4252-4263.

Lascombe, I., Beffa, D., Ruegg, U., Tarradellas, J., Wahli, W. (2000) Estrogenic activity assessment of environmental chemicals using *in vitro* assays: Identification of two new estrogenic compounds. *Environ Health Perspect* 108:621-629.

Le Guével, R., Pakdel, F. (2001) Assessment of oestrogenic potency of chemicals used as growth promoter by *in-vitro* methods. *Hum Reprod* 16:1030-1036.

Legler, J., van den Brink, C.E., Brouwer, A., Murk, A.J., van der Saag, P.T., Vethaak, A.D., van der Burg, B. (1999) Development of a stably transfected estrogen receptor-mediated luciferase reporter gene assay in the human T47D breast cancer cell line. *Toxicol Sci* 48:55-66.

Makela, S., Davis, V.L., Tally, W.C., Korkman, J., Salo, L., Vihko, R., Santti, R., Korach, K.S. (1994) Dietary estrogens act through estrogen receptor-mediated processes and show no antiestrogenicity in cultured breast cancer cells. *Environ Health Perspect* 102:572-578.

Matthews, J.B., Twomey, K., Zacharewski, T.R. (2001) *In vitro* and *in vivo* interactions of bisphenol A and its metabolite, bisphenol A glucuronide, with estrogen receptors  $\alpha$  and  $\beta$ . *Chem Res Toxicol* 14:149-157.

Meerts, I.A.T.M., Letcher, R.J., Hoving, S., Marsh, G., Bergman, A., Lemmen, J.G., van der Burg, B., Brouwer, A. (2001) *In vitro* estrogenicity of polybrominated diphenyl ethers, hydroxylated PBDEs, and polybrominated bisphenol A compounds. *Environ Health Perspect* 109:399-407.

Mellanen, P., Petanen, T., Lehtimaki, J., Makela, S., Bylund, G., Holmbom, B., Mannila, E., Oikari, A., Santti, R. (1996) Wood-derived estrogens: Studies *in vitro* with breast cancer cell lines and *in vivo* in trout. *Toxicol Appl Pharmacol* 136:381-388.

Meyers, M.J., Sun, J., Carlson, K.E., Katzenellenbogen, B.S., Katzenellenbogen, J.A. (1999) Estrogen receptor subtype-selective ligands: Asymmetric synthesis and biological evaluation of *cis*- and *trans*-5,11-Dialkyl-5,6,11,12-tetrahydrochrysene. *J Med Chem* 42:2456-2468.

Miksicek, R.J. (1993) Commonly occurring plant flavonoids have estrogenic activity. *Mol Pharmacol* 44:37-43.

Miksicek, R.J. (1994) Interaction of naturally occurring nonsteroidal estrogens with expressed recombinant human estrogen receptor. *J Steroid Biochem Mol Biol* 49:153-160.

Miller, D., Wheals, B.B., Beresford, N., Sumpter, J.P. (2001) Estrogenic activity of phenolic additives determined by an *in vitro* yeast bioassay. *Environ Health Perspect* 109:133-138.

Miodini, P., Fioravanti, L., Di Fronzo, G., Cappelletti, V. (1999) The two phyto-oestrogens genistein and quercetin exert different effects on oestrogen receptor function. *Br J Cancer* 80:1150-1155.

Moffat, G.J., Burns, A., VanMiller, J., Joiner, R., Ashby, J. (2001) Glucuronidation of nonylphenol and octylphenol eliminates their ability to activate transcription via the estrogen receptor. *Regul Toxicol Pharmacol* 34:182-187.

Moore, M., Mustain, M., Daniel, K., Chen, I., Safe, S., Zacharewski, T., Gillesby, B., Joyeux, A., Balaguer, P. (1997) Antiestrogenic activity of hydroxylated polychlorinated biphenyl congeners identified in human serum. *Toxicol Appl Pharmacol* 142:160-168.

Morito, K., Hirose, T., Kinjo, J., Hirakawa, T., Okawa, M., Nohara, T., Ogawa, S., Inoue, S., Muramatsu, M., Masamune, Y. (2001a) Interaction of phytoestrogens with estrogen receptors  $\alpha$  and  $\beta$ . *Biol Pharm Bull* 24:351-356.

Morito, K., Aomori, T., Hirose, T., Kinjo, J., Hasegawa, J., Ogawa, S., Inoue, S., Muramatsu, M., Masamune, Y. (2001b) Interaction of phytoestrogens with estrogen receptors  $\alpha$  and  $\beta$ . Kanazawa University, Japan.

Nakagawa, Y., Suzuki, T. (2001) Metabolism of bisphenol A in isolated rat hepatocytes and oestrogenic activity of a hydroxylated metabolite in MCF-7 human breast cancer cells. *Xenobiotica* 31:113-123.

Odum, J., Lefevre, P.A., Tittensor, S., Paton, D., Routledge, E.J., Beresford, N.A., Sumpter, J.P., Ashby, J. (1997) The rodent uterotrophic assay: Critical protocol features, studies with nonyl phenols, and comparison with a yeast estrogenicity assay. *Regul Toxicol Pharmacol* 25:176-188.

Otsuka Pharmaceutical Co., Ltd., Tokushima, Japan. (2001) submitted report.

Payne, J., Scholze, M., Kortenkamp, A. (2001) Mixtures of four organochlorines enhance human breast cancer cell proliferation. *Environ Health Perspect* 109:391-397.

Petit, F., Le Goff, P., Cravedi, J.-P., Valotaire, Y., Pakdel, F. (1997) Two complementary bioassays for screening the estrogenic potency of xenobiotics: Recombinant yeast for trout estrogen receptor and trout hepatocyte cultures. *J Mol Endocrinol* 19:321-335.

Petit, F., Le Goff, P., Cravedi, J.-P., Kah, O., Valotaire, Y., Pakdel, F. (1999) Trout oestrogen receptor sensitivity to xenobiotics as tested by different bioassays. *Aquaculture* 177:353-365.

Rajapakse, N., Ong, D., Kortenkamp, A. (2001) Defining the impact of weakly estrogenic chemicals on the action of steroid estrogens. *Toxicol Sci* 60:296-304.

Ramamoorthy, K., Wang, F., Chen, I.-C., Norris, J.D., McDonnell, D.P., Leonard, L.S., Gaido, K.W., Bocchinfuso, W.P., Korach, K.S., Safe, S. (1997a) Estrogenic activity of a dieldrin/toxaphene mixture in the mouse uterus, MCF-7 human breast cancer cells, and yeast-based estrogen receptor assays: No apparent synergism. *Endocrinology* 138:1520-1527.

Ramamoorthy, K., Vyhildal, C., Wang, F., Chen, I.-C., Safe, S., McDonnell, D.P., Leonard, L.S., Gaido, K.W. (1997b) Additive estrogenic activities of a binary mixture of 2',4',6'-trichloro- and 2',3',4',5' -tetrachloro-4-biphenylol. *Toxicol Appl Pharmacol* 147:93-100.

Rogers, J.M., Denison, M.S. (2000) Recombinant cell bioassays for endocrine disruptors: Development of a stably transfected human ovarian cell line for the detection of estrogenic and anti-estrogenic chemicals. *In Vitro & Mol Toxicol* 13:67-82.

Routledge, E.J., Sumpter, J.P. (1997) Structural features of alkylphenolic chemicals associated with estrogenic activity. *J Biol Chem* 272:3280-3288.

Schafer, T.E., Lapp, C.A., Hanes, C.M., Lewis, J.B., Wataha, J.C., Schuster, G.S. (1999) Estrogenicity of bisphenol A and bisphenol A dimethacrylate *in vitro*. *J Biomedical Mater Res* 45:192-197.

Seinen, W., Lemmen, J.G., Pieters, R.H.H., Verbruggen, E.M.J., van de Burg, B. (1999) AHTN and HHCB show weak estrogenic -- but no uterotrophic activity. *Toxicol Lett* 111:161-168.

Schlumpf, M., Cotton, B., Conscience, M., Haller, V., Steinmann, B., Lichtensteiger, W. (2001) *In vitro* and *in vivo* estrogenicity of UV Screens. Environ Health Perspect 109:239-244.

Shelby, M.D., Newbold, R.R., Tully, D.B., Chae, K., Davis, V.L. (1996) Assessing environmental chemicals for estrogenicity using a combination of *in vitro* and *in vivo* assays. Environ Health Perspect 104:1296-1300.

Soto, A.M., Chung, K.L., Sonnenschein, C. (1994) The pesticides endosulfan, toxaphene, and dieldrin have estrogenic effects on human estrogen-sensitive cells. Environ Health Perspect 102:380-383.

Soto, A.M., Sonnenschein, C., Chung, K.L., Fernandez, M.F., Olea, N., Serrano, F.O. (1995) The E-SCREEN assay as a tool to identify estrogens: An update on estrogenic environmental pollutants. Environ Health Perspect 103(Suppl 7):113-122.

Sumida, K., Ooe, N., Nagahori, H., Saito, K., Isobe, N., Kaneko, H., Nakatsuka, I. (2001) An *in vitro* reporter gene assay method incorporating metabolic activation with human and rat S9 or liver microsomes. Biochem Biophys Res Commun 280:85-91.

Sun, J.M.M., Fink, B.E., Rajendran, R., Katzenellenbogen, J.A., Katzenellenbogen, B.S. (1999) Novel ligands that function as selective estrogens or antiestrogens for estrogen receptor-alpha or estrogen receptor-beta. Endocrinology 140:800-804.

Tamir, S., Eizenberg, M., Somjen, D., Stern, N., Shelach, R., Kaye, A., Vaya, J. (2000) Estrogenic and antiproliferative properties of glabridin from licorice in human breast cancer cells. Cancer Res 60:5704-5709.

Tarumi, H., Imazato, S., Narimatsu, M., Matsuo, M., Ebisu, S. (2000) Estrogenicity of fissure sealants and adhesive resins determined by reporter gene assay. J Dent Res 79:1838-1843.

Tran, D.Q., Ide, C.F., McLachlan, J.A., Arnold, S.F. (1996) The anti-estrogenic activity of selected polynuclear aromatic hydrocarbons in yeast expressing human estrogen receptor. Biochem and Biophys Res Comm 229:102-108.

Tremblay, A., Tremblay, G.B., Labrie, C., Labrie, F., Giguere, V. (1998) EM-800, a novel antiestrogen, acts as a pure antagonist of the transcriptional functions of estrogen receptors  $\alpha$  and  $\beta$ . Endocrinology 139:111-118.

Vinggaard, A.M., Joergensen, E.C.B., Larsen, J.C. (1999) Rapid and sensitive reporter gene assays for detection of antiandrogenic and estrogenic effects of environmental chemicals. Tox Appl Pharm 155:150-160.

Vinggaard, A.M., Korner, W., Lund, K.H., Bolz, U., Petersen, J.H. (2000) Identification and quantification of estrogenic compounds in recycled and virgin paper for household use as determined by an *in vitro* yeast estrogen screen and chemical analysis. Chem Res Toxicol 13:1214-1222.

Wiese, T.E., Polin, L.A., Palomino, E., Brooks, S.C. (1997) Induction of the estrogen specific mitogenic response of MCF-7 cells by selected analogues of estradiol-17 $\beta$ : A 3D QSAR study. J Med Chem 40:3659-3669.

Xenobiotic Detection Systems, Inc., Durham, NC. (2001) submitted report.

Yoshihara, S.-i., Makishima, M., Suzuki, N., Ohta, S. (2001) Metabolic activation of bisphenol A by rat liver S9 fraction. Toxicol Sci 62:221-227.

Zacharewski, T.R., Meek, M.D., Clemons, J.H., Wu, Z.F., Fielden, M.R., Matthews, J.B. (1998) Examination of the *in vitro* and *in vivo* estrogenic activities of eight commercial phthalate esters. Toxicol Sci 46:282-293.